UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,220	09/24/2001	Akihiro Goto	Q65416	6650

7590 01/14/2003

Sughrue Mion Zinn
Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

EXAMINER	
EVANS, GEOFFREY S	
ART UNIT	PAPER NUMBER
1725	12

DATE MAILED: 01/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 12

Application Number: 09/937,220
Filing Date: September 24, 2001
Appellant(s): GOTO ET AL.

MAILED

JAN 13 2003

GROUP 1700

Yoshinari Kishimoto
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11-22-2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existance of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: The second issue is moot since the rejection of claims 1-3 under 35 U.S. C. 103(a) as being obvious over Magara in view of Graell is withdrawn.

(7) Grouping of Claims

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because it is not complete. Applicant argues claims 1 and 2 together and claim 3 separately. Therefore claims 1 and 2 rise and fall together.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,434,380	MAGARA et al.	07-1995

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Magara et al. in U.S. Patent No. 5,434,380. Regarding claim 1, Magara et al. has an electric power unit (see figure 14 of Magara et al.) for electric discharge surface treatment by which electric discharge is generated between an electrode (as shown by element 4 in figure 14) for electric discharge surface treatment and a workpiece (see element 5 in figure 14) so that a hard coating is formed on a surface of the workpiece. Magara et al. discloses a controller (as labeled in figure 14) that controls current flow through transistors TR_1 and TR_2 to divide the electric discharge current pulse into a first pulse width and a first peak value and a second pulse width and a second current peak as shown in figure 16(b). Magara et al. discloses that during the first pulse width, current flows through transistor TR_1 with a current value of 1.5 Amps (see column 9,lines 34-37), and during the second

pulse width (which is set at 2 microseconds as shown in figure 16(b) and disclosed in column 9,line 13), the current peak value is 3 Amps (see column 12,line 13). While Magara et al. does not disclose the specific duration of the first pulse width, it must be predetermined by the controller shown in figure 14 since there is no disclosure of any sensor or closed loop arrangement to adjust the first pulse width during the coating process. Since Magara et al. uses a predetermined control means that meets the equation ($2 \leq k \leq n$, k is an integer) of claim 1 by having 2=k=n with a predetermined pulse, a quantity of supply of hard coat material by the emission of the electrode material is a predetermined value that is set by the electrical conditions (i.e. the pulse width and the peak value), the amount of emission of the electrode onto the workpiece is controlled. When a short pulse width and a low peak value of current is present less of the electrode material is melted and emitted when compared to a longer pulse width with a higher peak value of current.

Regarding claim 2, Magara et al. teaches a method of electric discharge surface treatment, comprising the steps of dividing an electric discharge current pulse into a first pulse width with a first peak value, a second pulse width with a second peak value, where n=2, as shown in figure 16(b) of Magara et al.. Magara et al. uses a controller (see the element labeled as "controller" in figure 14) to set the current pulse's first pulse width and the first peak value that inherently limits the amount of emission of electrode material (which supplies the coating that forms on the workpiece) as compared to a higher peak value and pulse width. When there is less current flow there is less melting and emission of the electrode that forms the coating material. After a discharge is

formed, that diameter of the discharge expands. Applicant's own circuitry as shown in figure 1A does not disclose any closed loop control of the diameter of the discharge column. Applicant's circuitry (shown in figure 1A of the instant application) has just as much "control" over the diameter of the discharge column as that shown in figure 14 of the instant application; i.e. an open loop control that is set by the current flow across the gap. Since the controller (see figure 16(b)) of Magara et al. sets the k-th pulse width and the k-th peak value to meet the equation ($2 \leq k \leq n$, k is an integer) of claim 2 by having 2=k=n of the current density between the electrodes the emission of the electrode material is set to a predetermined value.

Regarding claim 3, Magara et al. teaches a method of electric discharge surface treatment, comprising the steps of dividing an electric discharge current pulse into a first pulse width with a first peak value, a second pulse width with a second peak value, where n=2, as shown in figure 16(b) of Magara et al.. Magara et al. uses a controller to set the current pulse's first pulse width and the first peak value that limits the amount of emission of electrode material (which supplies the coating that forms on the workpiece) as compared to a higher peak value and pulse width. Since the controller (see figure 16(b) sets the k-th pulse width and the k-th peak value to meet the equation ($2 \leq k \leq n$, k is an integer) of claim 3 by having 2=k=n such that the second pulse width and second peak value (which is 2 microseconds and 3 Amps respectively) at greater values than the first pulse with and first peak value, the emission of the coating material is increased to an predetermined amount that is set by the machining conditions of the respective values of the second pulse width and second peak current value.

(11) Response to Argument

Applicant argues on page 5,lines 12-14 of the Appeal Brief that Magara et al. does not teach or suggest that the pulse width and the peak value are controlled in a stepwise manner so that the quantity of supply of hard coat material by emission of electrode material is also controlled. Firstly, while Magara et al. does not specifically disclose that the coating created in the Magara et al. reference is "hard", figure 20 (a) shows using steel as the electrode material which is a known hard substance that would result in a "hard" coating. Applicant does not define in the specification when a coating is considered to be "hard" and when a coating is "not hard". Additionally Magara et al. discloses using tungsten carbide particles in the dielectric (see column 12,lines 43) that assists in creating a hard coating. Secondly, by controlling the electric conditions (i.e. the pulse width and the peak value) the amount of emission of the electrode onto the workpiece is controlled. When a short pulse width and a low peak value of current are present less of the electrode material is emitted when compared to a longer pulse width with a higher peak value of current.

Applicant further argues from page 5, lines 20 to page 6, column 3 that with respect to independent claims 1 and 2 that Magara et al. does not recite "the control means sets/(the step of) setting the first pulse width and the first peak value so that an electric current density between the electrodes can be in a predetermined range to suppress emission of electrode material, so that during a period of the first pulse width a diameter

of an electric arc column is extended." Magara et al. discloses a controller (see figure 14) that sets the first pulse width and first peak current value that suppresses the emission of the electrode as contrasted with the second pulse width and second peak current value.

Applicant argues with respect to claim 3 that the Magara et al. patent does not disclose the step of "setting the k-th pulse width and the k-th peak value ($2 \leq k \leq n$, k is an integer) so that an amount of hard coat material supplied to a space between the electrode and the workpiece is increased to a predetermined appropriate quantity for formation of said hard coat". Magara sets the k-th pulse width and the k-th peak value as shown in figure 16 (b) which meets the equation ($2 \leq k \leq n$, k is an integer) by having the values of k and n be equal to 2 ($2=k=n$). By using a second longer pulse width and a second larger peak current value, there is a greater amount of emission of the electrode to the workpiece to form the coating as contrasted with the first pulse width and first peak current value.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,
Geoffrey S Evans
Geoffrey S Evans
Primary Examiner
Art Unit 1725

GSE
December 18, 2002

Conferees
Tom Dunn TD
Michael Ball B.

Sughrue Mion Zinn
Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202